



C3.3.4 POLARIMETRY

C3.3.4.1 Rotation of the polarisation plane through sugar solutions

Rotation of the polarisation plane through sugar solutions (C3.3.4.1)

Cat. No.	Description	C3.3.4.1
657 591	Polarimeter	1
OHC R221	Compact Balance CR221, 220 g : 0.1 g	1
666 963	Spoon-ended spatula, stainless steel, 120 mm	1
665 793	Volumetric flask, Boro 3.3, 100 ml	3
664 153	Watch glass dish 60 mm Ø	3
665 009	Funnel PP 75 mm Ø	3
664 137	Beaker, Boro3.3, 100 ml, tall	3
672 1100	D(+)-Glucose, 100 g	1
672 0700	D(-)-Fructose, 50 g	1
674 6050	D(+)-Sucrose, 100 g	1

The term 'optical activity' refers to the property of some materials which rotate the polarisation plane of linearly polarised light as it passes through a substance. The angle of rotation α depends on the molecular structure and the concentration of the dissolved substance, on the distance that the light travels through the solution, and on the wavelength of the light.

Experiment C3.3.4.1 demonstrates that optically active substances can rotate the plane of a linearly polarised beam of light by a specific value. For a given cuvette length d , the angle of rotation α of an optically active solution is proportional to the concentration c of the solution.

To determine the concentration c of the solution, the following expression applies:

$$c = \frac{\alpha}{l \cdot [\alpha]}$$

specific rotation: $[\alpha]$ ($^{\circ}$ · ml/g · dm)

The angle of rotation is given as a positive (+) value when the polarisation plane of the light directed toward the observer rotates clockwise (to the right). Counterclockwise rotation is referred to as rotation to the left and expressed as a negative number, hence preceded by a minus sign (-).